

Science of Microbes

Activity 11 Microbes and Disease

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Science of Microbes

Microbes and Disease is the eleventh lesson in the unit, *The Science of Microbes*. It addresses National Science Education Content Standards related to Inquiry and Life Science. See the downloadable lesson PDF (web address below) for a complete list of the standards addressed.

In this activity, students will read and collect information on several dangerous pathogens, and will learn about the serious impacts of disease on individuals and societies.

Viewing this presentation fulfills part of the requirements for completing the short course on *The Science of Microbes*, offered on BioEd Online for professional development contact hours. *The Science of Microbes* Teacher's Guide may be obtained in its entirety from the Center for Educational Outreach at Baylor College of Medicine (1-800-798-8244). You can download a PDF of this lesson and other lessons from the Science of Microbes unit (including a unit pre/post assessment) from www.BioedOnline.org or www.K8Science.org.

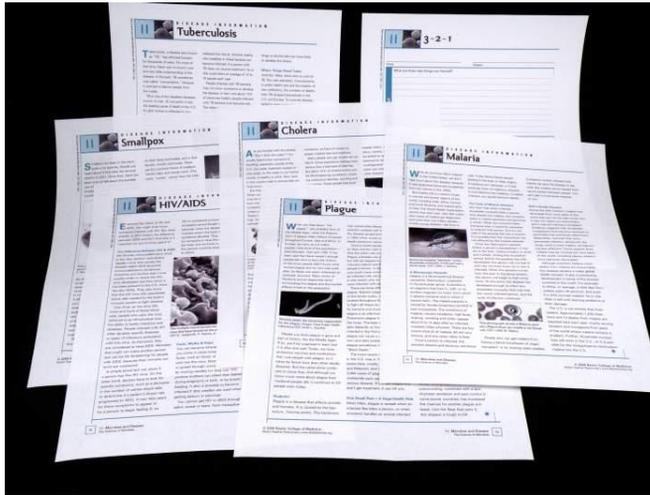
Reference:

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5R25RR018605 from the National Center for Research Resources, National Institutes of Health (NIH) to Baylor College of Medicine. The unit was developed in partnership with the Baylor-UT Houston Center for AIDS Research, an NIH-funded program (AI036211). The opinions, findings, and conclusions expressed in this presentation are solely those of the authors and do not necessarily reflect the views of Baylor College of Medicine or the sponsoring agencies.

Materials for Each Group of Four Students



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Materials

Divide the class into groups of 4 students. Each group will need the following materials.

- Paper and supplies for art projects. Place these supplies in a central location for the entire class.
- Sheet of paper on which to create an activity concept map.
- 6 copies of the 3-2-1 student sheet
- 4 copies of a teacher-selected *Disease Information* sheet. All members of the same group should receive the same disease sheet.
- Group concept map (ongoing)

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Image Reference:

Denk, J.P. (2009). Materials for Activity 11. Baylor College of Medicine, Houston, TX.

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Safety Considerations

- Follow all instructions.
- Begin investigation only when instructed.
- Have a clear understanding of the investigation in advance.
- Wash hands thoroughly after the investigation.



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Safety Considerations

It is important that students always think about safety when conducting a science investigation. This slide may be used to review safety with your class before starting the activity. Also, keep the following points in mind.

- Always follow district and school safety guidelines.
- Have a clear understanding of the investigation in advance (practice any investigation with which you are not familiar).
- Continually monitor the area where the investigation is being conducted.

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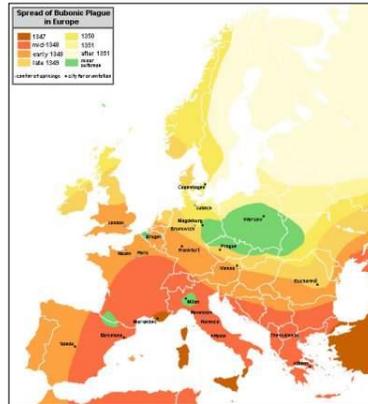
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Effect of Disease on History and Society

- Do you think diseases have changed history?
- Do any diseases affect society today?
- Read your assigned Disease Information sheet.
- As a group, create a concept map that summarizes the important ideas from the Disease Information sheet.



Map showing the spread of the bubonic plague in Europe (1347–1351).



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Effect of Disease on History and Society

Open a discussion with your students by asking them to respond to the following questions. *Do you think diseases have changed history? Do any diseases affect society today?* You may want to list students' responses on the board and discuss their answers to gauge how much students already know about these diseases.

Provide each group with 4 copies of the same Disease Information sheet. Each group should study a different disease (activity includes tuberculosis, malaria, plague, cholera, smallpox and HIV/AIDS).

Each student should read the Disease Information sheet distributed to his/her group, and discuss this disease with the group. Following the discussion, each group should create a concept map summarizing the key ideas from its assigned Disease Information sheet.

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Image Reference:

Zenner, R. Map showing spread of bubonic plague in Europe. Retrieved 11-13-2009, from [http://en.wikipedia.org/wiki/Plague_\(disease\)](http://en.wikipedia.org/wiki/Plague_(disease)).

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Let's Talk About It

- Each group: prepare and present information about its assigned disease.
- Within your group, discuss the information presented by each of the other groups on other diseases. Then, complete a 3-2-1 sheet for all six diseases.
- As a group, create a piece of art representing one of the six diseases and write a paragraph explaining the artwork.



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Let's Talk About It

Distribute six copies of the 3-2-1 student sheet to each group. Have the members of each group present their concept map and information about their assigned disease to the class. After each presentation, allow time for a class discussion about the disease. Have each group complete a 3-2-1 sheet for each disease.

Assign a new disease to each group. Groups should create a piece of art that illustrates their respective diseases and write an accompanying paragraph that explains how their artwork represents the disease. Have each group select one student to present its artwork and explanation to the class.

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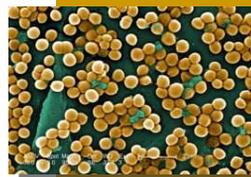
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Extension

- What is a zoonosis or zoonotic disease?
- What animal is the source (reservoir) of West Nile virus in our country?
- How do humans become infected with West Nile virus?
- When did the H1N1 influenza virus first appear, and what was its effect?
- What steps are being taken worldwide to prevent an H1N1 pandemic (global outbreak)?
- From what you have learned in *The Science of Microbes*, what precautions could every person take to prevent the spread of these emerging diseases?



H1N1 Viruses



Staphylococcus aureus



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Extension

Have the class view the following YouTube videos, which discuss emerging disease threats.

Virus Crisis (West Nile virus) - <http://www.youtube.com/watch?v=91b3MCAIYSI>

Governments Prepare for H1N1 Pandemic (H1N1 virus) - <http://www.youtube.com/watch?v=CW3aqzzuUJ8>

After viewing the videos, have the class answer the questions on the slide.

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Image References:

H1N1 Virus. Centers for Disease Control and Prevention. Retrieved 11-13-2009, from

<http://www.cdc.gov/h1n1flu/images.htm>
Carr, J. (2005). *Staphylococcus aureus*. Centers for Disease Control and Prevention. Retrieved 11-13-2009, from <http://phil.cdc.gov/phil/>.

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